Modifying Software Images for Routers

Router Software Version 10.0
Site Manager Software Version 4.0

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Bay Networks

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About This Guide

This guide describes how to customize a Bay Networks router software image using a tool called the Image Builder. You access the Image Builder using the Bay Networks Site Manager.

Use this guide when you receive router software from Bay Networks and you want to do the following:

- Remove nonessential executable files from the router software image (or add executable files that you inadvertently removed).
- Reduce the size of a router software image so that it fits on a single diskette (if you received the image on more than one diskette).

Audience

Written for system and network managers, this guide describes how to use Image Builder to customize router software images.

Before You Begin

Before using this guide, you must load the Bay Networks Site Manager application using the instructions provided in *Quick-Starting Routers.*

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Once you are online, you can reach our forum by typing the command GO BAYNETWORKS at any ! prompt.

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Bay Networks maintains a WWW Home Page that you can access at http://www.baynetworks.com. One of the menu items on the Home Page is the Customer Support Web Server, which offers technical documents, software agents, and an E-mail capability for communicating with our technical support engineers.

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Conventions

This section describes the conventions used in this guide.

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: if command syntax is **ping** *<ip_address>*, you enter **ping 192.32.10.12**

arrow character (→)	Separates menu and option names in instructions. Example: Protocols→AppleTalk identifies the AppleTalk option in the Protocols menu.
bold text	Indicates text that you need to enter and command names in text. Example: Use the **dinfo** command.
brackets ([ ])	Indicate optional elements. You can choose none, one, or all of the options.
italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.
`screen text`	Indicates data that appears on the screen. Example: `Set Bay Networks Trap Monitor Filters`
ellipsis points	Horizontal (. . .) and vertical (⋮) ellipsis points indicate omitted information.
vertical line (|)	Indicates that you enter only one of the parts of the command. The vertical line separates choices. Do not type the vertical line when entering the command. Example: If the command syntax is **show at routes** | **nets**, you enter either **show at routes** or **show at nets**, but not both.

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Acronyms

ASCII	American Standard Code for Information Interchange
DOS	Disk Operating System
PCMCIA	Personal Computer Memory Card International Association

Chapter 1
Image Builder Overview

Read this chapter for an overview of

- Router software images (see page 1-1)
- Using the Image Builder to modify router software images (see page 1-2)

Overview of Router Software Images

A router software image is a group of executable files that operates the protocols on your network with a Bay Networks router. The type of software image a router uses depends on the particular Bay Networks router.

Table 1-1 lists the router software images for the current router software. If you are using a lower version of Bay Networks router software, refer to the appropriate version of this guide for details on router software images.

Table 1-1. Router Software Image Types

Router	Router Software Image	Device That Image Runs On
AFN® (Flash)	afn.exe	Flash card
IN	in.exe	Flash card
ASN™	asn.exe	Flash card
BLN®	bn.exe	Flash card
BCN®	bn.exe	Flash card

(continued)

Table 1-1. Router Software Image Types *(continued)*

Router	Router Software Image	Device That Image Runs On
AN™	an.exe	Flash Single Inline Memory Modules (SIMMs)
CN®, FN™, LN® (VME)	ace.out	Flash card

Appendix A lists all of the executable files that are available from Bay Networks.

You can modify a router software image as follows:

- Remove a protocol that you do not use. You might want to remove protocols to make more space available on the medium that contains the router software image.
- Add a protocol that you removed inadvertently.
- Consolidate the software image. Sometimes Bay Networks supplies the software image on two diskettes. You might want to consolidate the two parts into one image.
- Replace an existing image with an entirely new one.

To perform these tasks, you use the Image Builder, as the following section describes.

Using the Image Builder to Modify Router Software Images

The Image Builder tool lets you customize the router software images that you receive from Bay Networks. You access the Image Builder from the Tools menu in the main Site Manager window.

To customize a router software image, you must do the following:

1. **Order the new router software from Bay Networks. This software comes on CD-ROM or on 3 1/2-inch MS-DOS diskettes.**
2. **Load the router software onto the local hard drive of your UNIX workstation or PC (refer to Chapter 2).**
3. **Load the router software into the Image Builder (refer to Chapter 2).**
4. **Remove or add executable files as necessary (refer to Chapter 3).**

5. **Save the customized software image (refer to Chapter 3).**
6. **Load the customized router software image onto the router's file system. You can use the Router Files Manager tool to remotely transfer the image to the router (refer to Chapter 4).**

Note: *Be sure that you use only executable files from the same router software version. For example, you cannot mix files from Version 8.00 with files from Version 8.10.*

7. **Boot the router using the customized software image (refer to Chapter 4).**

In addition to modifying a router software image by removing or adding executable files, you can use the Image Builder to do the following:

- View information about the components that appear in the Image Builder window (refer to Chapter 3). The Image Builder displays a router software image as a list of individual components. You can view information about the components such as
  - — Component name and order number
  - — Router software version
  - — Compressed size of files
  - — Uncompressed size of files
- Display all the files that make up a list of components (refer to "Image Builder Window" in Chapter 3).
- Convert an image you created to an equivalent image for a different type of router (refer to "Converting an Image for Other Types of Routers" in Chapter 3).
- Convert an image you created to an equivalent image for a different software version (refer to "Converting an Image for Other Software Versions" in Chapter 3).
- Create an entirely new router software image. For example, you might want to make an entirely new image from several custom images that you created (refer to "Creating a New Image" in Chapter 3).

Chapter 2
Loading Router Software

Read this chapter for information on the following topics:

- Loading router software onto a PC or UNIX workstation (see page 2-1)
- Loading router software into the Image Builder (see page 2-5)

Loading Router Software onto a PC or UNIX Workstation

Bay Networks router software is available on the following media:

- MS-DOS diskettes
- CD-ROM

The following sections present information on how to load the router software.

Loading the Software from MS-DOS Diskettes

Follow these steps to load the router software from MS-DOS diskettes onto the PC that serves as the Site Manager workstation:

1. **Enter the following command to create the directory in which to store the new router software on the Site Manager workstation:**

   mkdir \wf*xxx*

   xxx is the version of router software.

   For version 9.00, you would type

   mkdir \wf\900

2. **Insert the first diskette into the diskette drive of the PC, and enter the following command:**

   restore *<diskette_drive> <drive>***:\wf***xxx****.***

   diskette_drive is the drive containing the router software diskette and *drive* is the hard drive where you created the directory in which to store the router software.

   The operating system extracts the files to the subdirectory you created in Step 1 and prompts you for the next diskette.

3. **Insert the next router software diskette (when prompted) and press any key to continue.**
4. **Repeat Step 3 for the remaining diskettes.**
5. **Start up Site Manager.**

   For instructions, refer to *Using Site Manager Software*.

You can now load the router software into the Image Builder, as described in "Loading Router Software into the Image Builder."

Loading the Software from CD-ROM

The steps that you follow to load the router software from CD-ROM depend on whether you use a PC or a UNIX workstation. The next section describes how to load the software on a PC. If you use a UNIX workstation, proceed to the section "UNIX Workstation."

PC

To load the router software from CD-ROM to your PC, follow these steps:

1. **Insert the CD-ROM into your CD-ROM drive.**
2. **Bring up Windows.**
3. **Double-click on the File Manager icon.**
4. **Click on the CD-ROM drive icon in the File Manager window.**
5. **Click on the** *rtr_xxx* **directory, where** *xxx* **is the router software version.**

   For example, for Version 9.00, you would click on the *rtr_900* directory.

   You see the following directories in the *rtr_xxx* directory.

afnflash

an

asn

bn

in

vme

6. **Click on the directory for your router platform (refer to Table 1-1).**
7. **Select File→Copy.**
8. **Specify the destination directory as follows:**

   \wf*xxx*

   xxx is the version of the router software.

   For Version 9.00, type

   \wf\900

9. **Click on OK.**

   The system then loads the router software for the platform you selected. When the process is complete, you can load the router software for any of the other platforms by repeating Steps 6 through 9.

UNIX Workstation

To load the router software from CD-ROM to your UNIX workstation, follow these steps:

1. **Insert the CD-ROM into your CD-ROM drive.**
2. **If you have not already created a CD-ROM mountpoint, log in as *root* and create a root-level directory.**

   For example, to create a directory named *cdrom*, enter

   mkdir /cdrom

3. **Mount the CD-ROM drive.**

   a. **If you use SunOS on a SPARCstation, enter**

      mount -r -t hsfs /dev/*<device>* **/cdrom**

b. **If you use Solaris on a SPARCstation, enter**

mount -F hsfs -o ro /dev/*<device>* **/cdrom**

Note: *If you use Solaris and you are running the* vold *daemon, the CD-ROM will automatically be mounted as* /cdrom/release_xxx_yyy (*where* xxx *is the router software version and* yyy *is the Site Manager version), rather than /*cdrom. *For example, for router software Version 900 and Site Manager Version 3.00, the CD-ROM will automatically be mounted as* /cdrom/release_900_300.

c. **If you use an IBM RS/6000, enter**

mount -o ro -v cdrfs /dev/*<device>* **/cdrom**

d. **If you use an HP 9000, enter**

mount -r /dev/*<device>* **/cdrom**

4. **Change directories by entering**

cd /cdrom

5. **Run the script to load the router software using one of the following procedures:**

a. **On a SPARCstation, enter**

./COPY.SH

b. **On an HP 9000, enter**

./COPY.SH\;1

c. **On an IBM RS/6000, enter**

./copy.sh

During the load procedure, you must specify the following:

- The directory where you want to load the router software
- The router platform (AFNFLASH, AN, ASN, BN, IN, or VME)

The system then loads the software for the platform you select. When the process is complete, you can choose to load the router software for another platform, or you can quit.

Loading Router Software into the Image Builder

To load the router software into the Image Builder, follow these steps:

1. **Select File→Open from the Image Builder window.**

   The Open window appears (Figure 2-1).

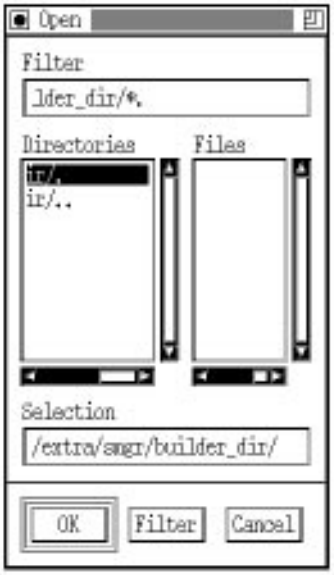

Figure 2-1. Open Window

2. **Select the directory and filename of the router software image that you want to open. Then click on OK.**

The directory and filename that you specify depend on the following:

- The computer platform (UNIX workstation or PC)
- The router platform

If you loaded the router software from CD-ROM onto a UNIX workstation, the system stored the image in the directory for the appropriate router platform. For example, you would find the image *ace.out* for the VME platform in the *vme* directory.

If you loaded the router software onto a PC, the system stored the router software image in the directory you created for the router software (*\wf\xxx)*.

Once you enter the pathname of the image, the Image Builder window lists the current components of the image (Figure 2-2).

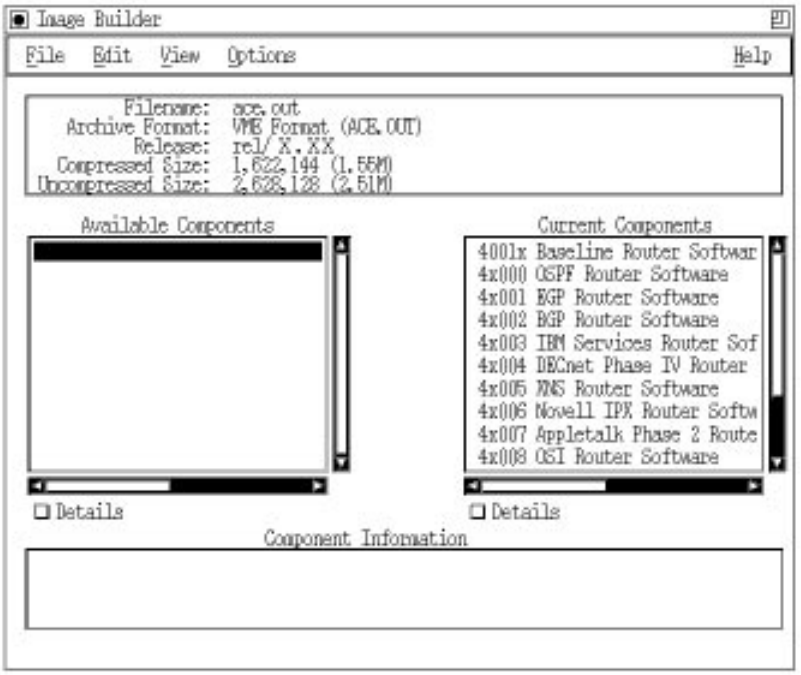

Figure 2-2. Image Builder Window with Current Components

You can now modify the router software image. For instructions, refer to “Modifying a Router Software Image” in Chapter 3.

Chapter 3
How to Use the Image Builder

Read this chapter for information on the following tasks:

- Modifying a router software image (see page 3-1)
- Saving a modified image (see page 3-8)
- Creating a new image (see page 3-10)
- Converting an image for other types of routers (see page 3-12)
- Converting an image for other software versions (see page 3-13)
- Saving the contents of the current component list to a file (see page 3-14)

For specific information about using the windows, buttons, and other features of Site Manager, refer to *Using Site Manager Software*; for information about the Image Builder, refer to Chapter 1.

Modifying a Router Software Image

When you load your router software image into the Image Builder (refer to Chapter 2), you see the router software you loaded in the Current Components list of the Image Builder window (Figure 3-1).

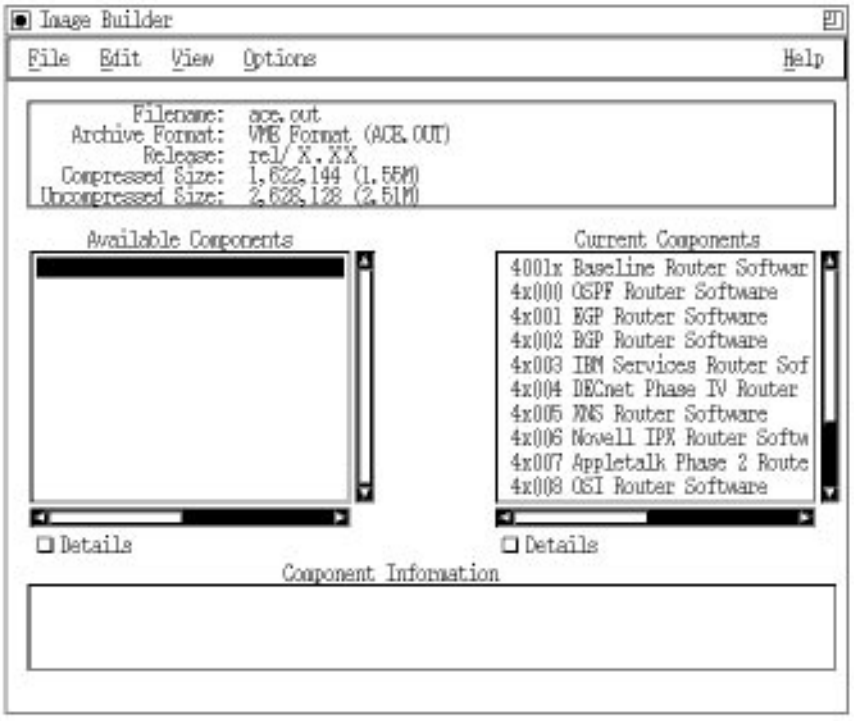

Figure 3-1. Image Builder Window with Current Components

You can modify the router software image as follows:

- Remove nonessential files from the Current Components list. For example, you might want to make more space available on the router software medium.
- Add components to the Current Components list. For example, you might have removed files that you decide you want in the router software image.

The following sections describe the Image Builder features that let you remove and add software components. The next section describes the features of the Image Builder window that allow you to modify the router software image.

Image Builder Window

The Image Builder window provides several features that you can use to determine the files that make up a software image and to track changes. These features include the following:

- A Component Information box that gives details about a selected component
- A special symbol (an asterisk) that identifies components from which you removed a file
- A Details button that you can use to display all the files that make up a list of components

The following sections provide information on these features.

Component Information Box

The bottom of the Image Builder window contains a Component Information box (Figure 3-2). When you select a component from the Available Components or Current Components list, the following information appears in the Component Information box:

- Order number and name of component
- Router software version
- Compressed size of files
- Uncompressed size of files

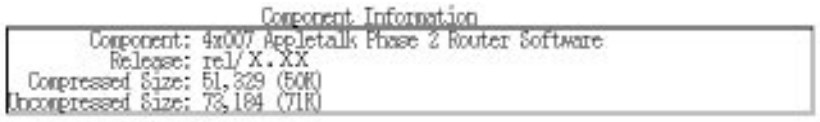

Figure 3-2. Component Information Box in the Image Builder Window

Partial Component Asterisk

The Image Builder uses an asterisk (*) to denote a partial component (Figure 3-3). The asterisk indicates that you removed a file from a component.

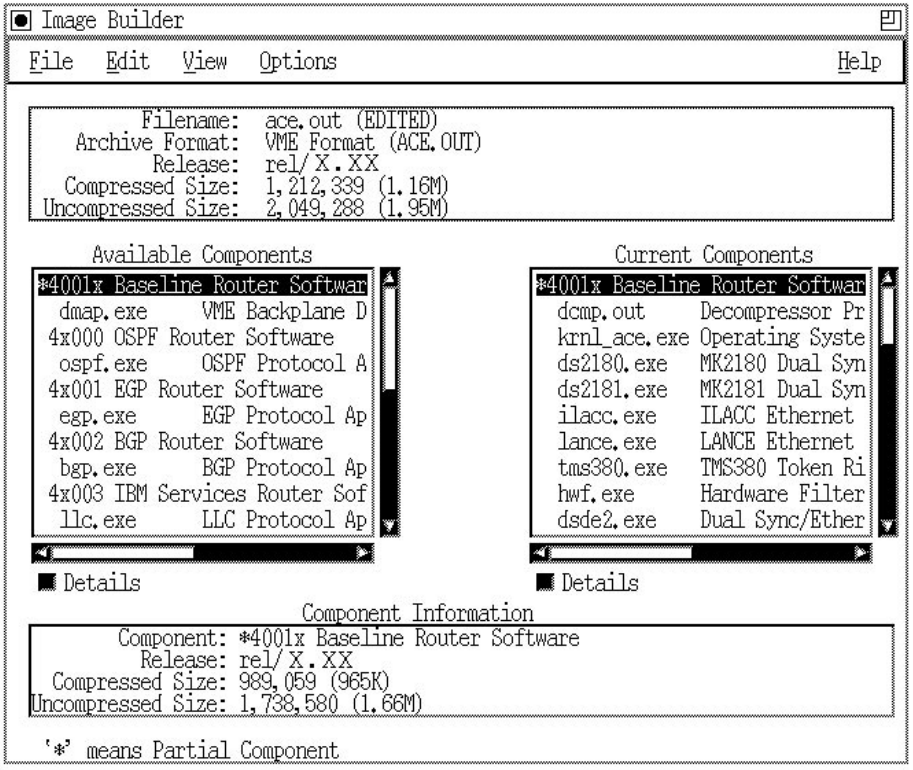

Figure 3-3. Partial Components

Details Buttons

A Details button appears below each list of components. You can click on the Details button to display all the executable files that make up a list of components. To return to the list of components, click on the Details button again.

For example, if you click on the Details button for current components, all the components in that list open to reveal the executable files that make up those components. Most protocol components contain only one software file. The Baseline Router Software component, however, contains many files, including the Operating System Kernel.

You can also use the options on the View menu to display details about a list of components.

Removing Software Components

To remove components from the Current Components list, follow these steps:

1. **Double-click on the item in the Current Components list that you want to remove.**

   The Remove button appears in the Image Builder window (Figure 3-4).

Note: *The Remove button does not appear when you select essential files. This protects the most important files that make up your router software image. For example, you cannot remove the Operating System Kernel file from the Baseline Router Software component. Also, because the Baseline Router Software component contains essential files, you cannot remove it from the list of current components.*

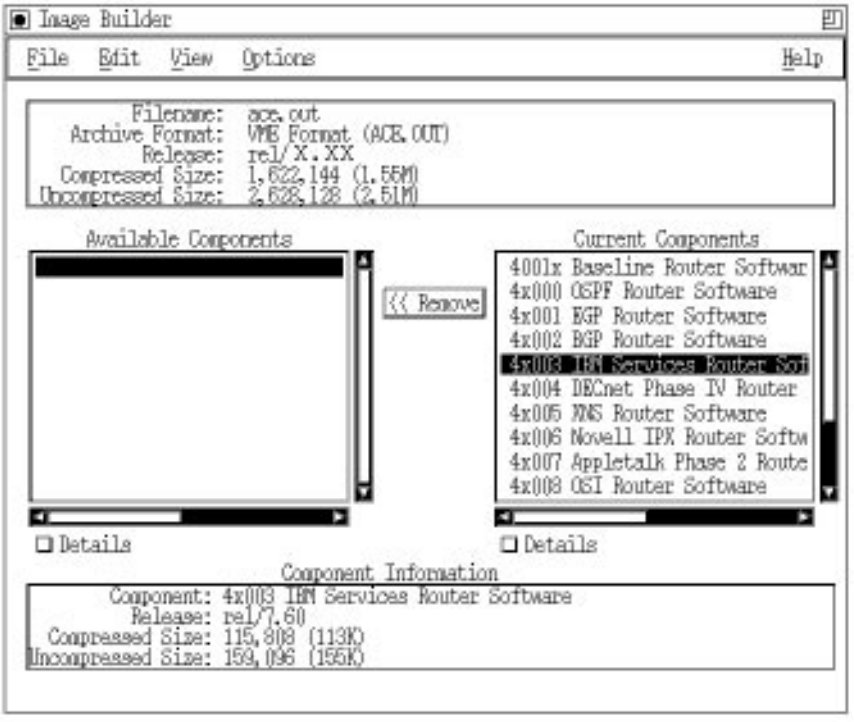

Figure 3-4. Remove Button

2. **Click on Remove.**

   The Image Builder removes the component from the Current Components list and adds it to the Available Components list.

You can also select Edit→Remove Component in the Image Builder window. You can remove all components from the Current Components list by selecting Edit→Remove All Components. You do not need to select all the components before you choose this option.

The Edit menu in the Image Builder window also contains Undo and Redo options that let you cancel your last action or redo your last cancelled action.

Adding Software Components

When you remove a component from the Current Components list, the Image Builder adds it to the Available Components list. If you decide you want to keep that component in the router software image, you must add it to the Current Components list. To do so, follow these steps:

1. **Double-click on the item in the Available Components list that you want to add to the current components.**

   The Add button appears in the Image Builder window (Figure 3-5).

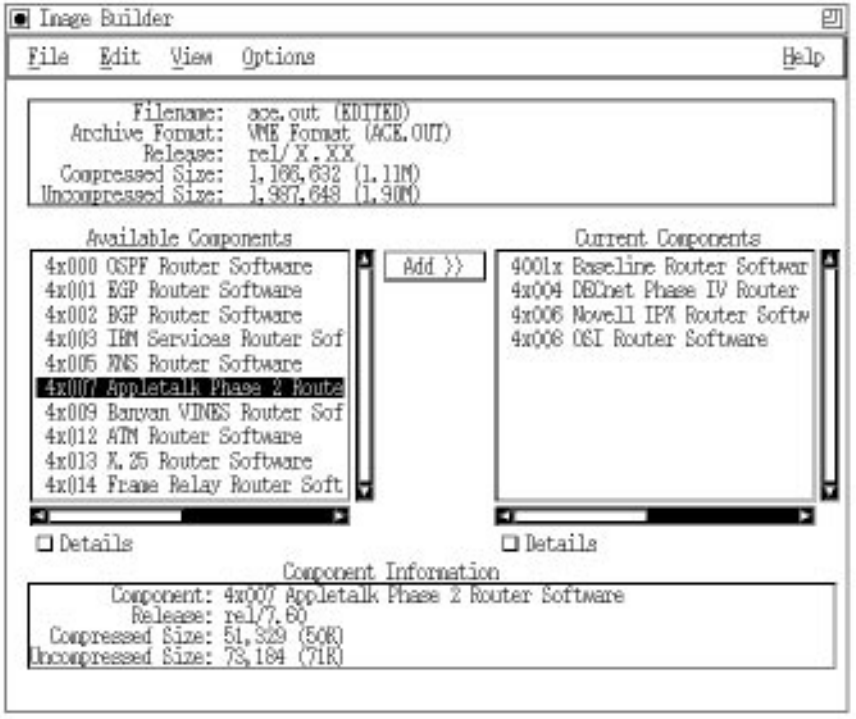

Figure 3-5. Add Button

2. **Click on the Add button.**

   The component moves from the Available Components list to the Current Components list.

You can also add components by selecting Edit→Add from the Image Builder window. To add all components that appear in the Available Components list, select Edit→Add All Components. You do not need to select all the components before you choose this option.

Note: *In Figure 3-3, the word EDITED appears in parentheses beside the* ace.out *filename. EDITED appears whenever you load a previously modified file into the Image Builder.*

Saving a Modified Image

The Image Builder automatically archives router software images in the *$HOME/.builder_dir* directory, which is created during the Site Manager installation process. (Refer to *Quick-Starting Routers* for information on creating the *$HOME/.builder_dir* directory.)

The Image Builder archives only individual components in this directory. We recommend that you archive new router software images in a different directory. You should also use different image names for different routers on your network, and keep a record of which images are running on which routers.

If you loaded the router software onto your Site Manager workstation using the procedure in the section "Loading Router Software onto the PC or UNIX Workstation" in Chapter 2, you may want to use the directory you created during that procedure for archiving the image. To save the modified image, follow these steps:

1. **After you modify a list of current components, select File→Save from the Image Builder window.**

   This saves the image to your current directory and archives all components displayed in the Image Builder window in the Image Builder directory.

Note: *A confirmation window does not appear after you select File→Save, so make sure you compiled your list correctly before you select this option.*

2. **To archive an image, select File→Save As from the Image Builder window.**

   The Save As window appears (Figure 3-6).

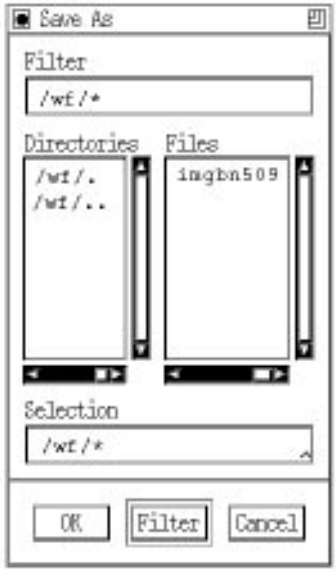

Figure 3-6. Save As Window

3. **Select a directory for archiving images and type a filename in the Selection field. Then click on OK.**

   Information about the new image replaces the information about the image you loaded into the Image Builder. The updated information appears in a box at the top of the Image Builder window (Figure 3-7). If you are copying the new image to a diskette, use the image information to check the size of the image to make sure that it will fit on the diskette.

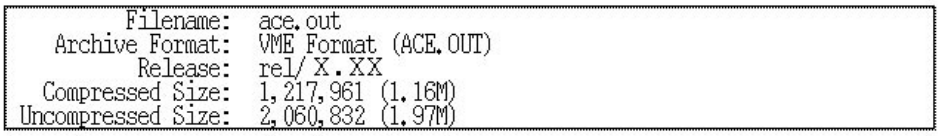

Figure 3-7. Image Information Box in the Image Builder Window

Note: *The confirmation window (Figure 3-8) appears if you select File→Exit without saving your changes.*

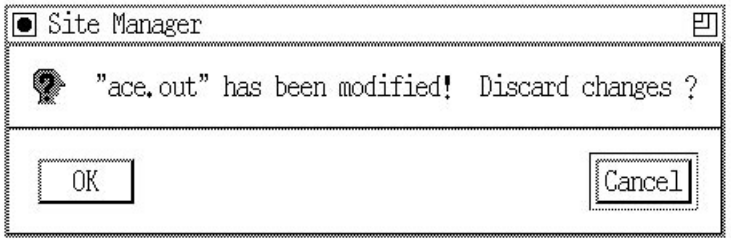

Figure 3-8. Confirmation Window

After you save the new image, refer to Chapter 4 for information on loading the new image on your router.

Creating a New Image

Creating an entirely new image is usually not necessary. However, the Image Builder provides the option in case you need it. For example, you might want to completely reconfigure the router software image or perform a major upgrade (such as from 7.60 to 9.00). To create a new image, follow these steps:

1. **Select File→New from the Image Builder window.**

Note: *You will be unable to select the New command unless the router software files are archived in the Image Builder's directory* ($HOME/.builder_dir).

The New Image window appears (Figure 3-9).

Figure 3-9. New Image Window

Note: *The image formats that appear in the New Image window are for router images that you loaded into the Image Builder. For example, in Figure 3-9, only the BN/BNX and VME formats appear in the New Image window. If the format you need is not listed in this window, refer to "Proceeding When an Image Format Is Not Available."*

2. **Select the appropriate image format; then click on OK.**

An empty Image Builder window appears.

You are now ready to build a new image using the router software on your workstation. Refer to Chapter 2 for information on loading router software into the Image Builder.

Converting an Image for Other Types of Routers

Note: *You can only use this feature to convert to image formats that you previously loaded into the Image Builder.*

If you want to run the same image on different types of Bay Networks routers in a network, you can create an image for one type of router and convert the image to run on other types of routers. For example, you might want to run the same protocols on AN™ and BN™ routers in a network. You can customize an image for the BN routers and then convert that image to run on the AN routers.

To convert an image to run on a different type of router:

1. **Select File→Change Format in the Image Builder window.**

   A list of image formats appears. The possible image formats are

   - *AFN*
   - *AN*
   - *ASN*
   - *BN*
   - *IN*
   - *VME*
   - *One board* (AFN Flash for software versions lower than 8.10)

   If the image format you want is grayed out, you have not loaded that image into the Image Builder. Refer to "Proceeding When an Image Format Is Not Available."

2. **Select a format from the list.**

   The image changes to the format you selected.

3. **Save the modified image (refer to "Saving a Modified Image").**

Proceeding When an Image Format Is Not Available

If you cannot choose the image format you want when you try to create a new image or convert an image for another type of router, you need to load the image for that format into the Image Builder.

To load the image:

1. **Check that the software image for the format (refer to Table 1-1) appears in the directory where you loaded the router software.**
   a. **If the image does appear in that directory, load the files into the Image Builder (refer to "Loading Router Software into the Image Builder" in Chapter 2).**
   b. **If the image does not appear in the directory where you loaded the router software, you must load the image onto your workstation (refer to "Loading Router Software onto a PC or UNIX Workstation" in Chapter 2) and then load the image in the Image Builder.**
2. **Repeat the procedure for creating a new image or converting an image for another type of router.**

Converting an Image for Other Software Versions

Note: *You can only use this feature to convert to software versions that you previously loaded into the Image Builder.*

In a network, you may have Bay Networks routers that use different versions of Bay Networks software. If you want to run the same image on those routers, you can create an image for a router running one software version and convert the image for routers running other software versions. For example, you might want to run the same image on routers running Version 7.60 software and routers running Version 9.00 software. You can create an image with Version 9.00 files and convert the image to use Version 7.60 files.

To convert an image to a different software version:

1. **Select File→Change Release.**

   A list of software versions appears. If you cannot select the version you want, you need to load that version into the Image Builder. Refer to "Proceeding When a Software Version Is Not Available."

2. **Select a version from the list.**

   The image changes to the software version you selected.

3. **Save the modified image (refer to "Saving a Modified Image").**

Proceeding When a Software Version Is Not Available

If you cannot choose the software version you want when you try to convert an image for another software version, you need to load the image with the appropriate format and software release into the Image Builder.

To load the image:

1. **Check that the software image for the relevant format (refer to "Overview of Router Software Images" in Chapter 1) appears in the directory where you loaded the appropriate version of the router software. For example, if you want to convert an image for an AN router to Software Version 9.00, check that the AN router software image appears in the directory where you loaded the Version 9.00 software.**
   a. **If the image does appear in that directory, load the files into the Image Builder (refer to "Loading Router Software into the Image Builder" in Chapter 2).**
   b. **If the image does not appear in the directory where you loaded the router software, you must load the image onto your workstation (refer to "Loading Router Software onto a PC or UNIX Workstation" in Chapter 2) and then load the image in the Image Builder.**
2. **Repeat the procedure for converting an image for another software version.**

Saving the Contents of the Current Component List to a File

You can save to an ASCII file the contents of the Current Components list in the Image Builder window. To do so, select Options→Generate CONTENTS.TXT. (By default, the option is already selected.)

When you save an image by selecting File→Save or File→Save As, an ASCII file named *CONTENTS.TXT* is created and saved to the same directory you specified for the image.

The *CONTENTS.TXT* file lists all the order numbers, components, filenames, and descriptions shown in the Current Components window. Figure 3-10 shows a portion of a sample *CONTENTS.TXT* file.

Note: *If you do not specify a directory, by default your image and* CONTENTS.TXT *file are saved to the Image Builder's directory.*

```
    Image File:  /extra/smgr/has/image
    Created on:  Wed Jan  4 16:40:04 1995
Archive Format:  VME Format
      Release:  int/8.10/40
    File Size:  2,273,875 (2.17M)

C O N T E N T S
---------------

*4001x Baseline Router Software
            dcmp.out     Decompressor Program
            krnl_ace.exe Operating System Kernel
            dmap.exe     VME Backplane DMA Processor Driver
            arp.exe      ARP Protocol Application
            debug.exe    DEBUG Protocol Application
            ds2180.exe   MK2180 Dual Sync Interface Driver
            ds2181.exe   MK2181 Dual Sync Interface Driver
            dsde2.exe    Dual Sync/Ethernet2 Link Module Driver
            dst.exe      Dual Sync Token Link Module Driver
            dtok.exe     Dual Token Ring Link Module Driver
            dvmrp.exe    DVMRP Multicast Protocol Application
            e1.exe       E1 Link Module Driver
            enet2.exe    Ethernet2 Link Module Driver
            fddi.exe     FDDI Link Module Driver
            fsi.exe      FDDI SMT Driver
            ftp.exe      FTP Protocol Application
            hdlc.exe     HDLC Protocol Application
            hfsi.exe     HSSI SMT Driver
            hssi.exe     HSSI Link Module Driver
            hwf.exe      Hardware Filter Driver
            igmp.exe     IGMP Multicast Protocol Application
            ilacc.exe    ILACC Ethernet Interface Driver
            ip.exe       IP Protocol Application
            lance.exe    LANCE Ethernet Interface Driver
            lm.exe       Line Manager Protocol Application
            mct1e1.exe    Multi-Channel T1E1 Link Module Driver
            munich.exe    Munich Multi-Channel T1E1 Driver
            nbip.exe     NetBIOS/IP Protocol Application
            pcap.exe     Packet Capture Procotol Application
            ping.exe     Ping Protocol Application
            ppp.exe      PPP Protocol Application
```

Figure 3-10. CONTENTS.TXT File

Chapter 4
Loading the Modified Image on a Router

Read this chapter for information on the following topics:

- Connecting to a Bay Networks router (see page 4-1)
- Loading a modified image on the router's file system (see page 4-5)
- Booting the router with a modified image (see page 4-9)
- Verifying that the router booted successfully (see page 4-10)

Connecting to a Bay Networks Router

You must specify the routers onto which you will load the modified router software image. You can load an image onto more than one router at a time.

1. **From the Site Manager window, select Options→Router Connection.**

   The Router Connection Options window appears (Figure 4-1).

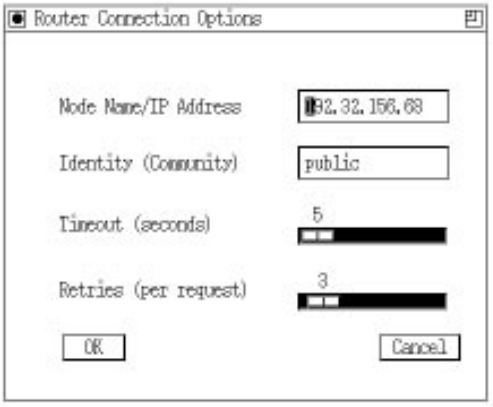

Figure 4-1. Router Connection Options Window

2. **In the Node Name/IP Address field, type the IP address of the Bay Networks router to which you want to connect. Then click on OK.**

Note: *You do not need to change the default values that appear in the Identity, Timeout, and Retries fields.*

Information on the router you specified appears in the Site Manager window (Figure 4-2).

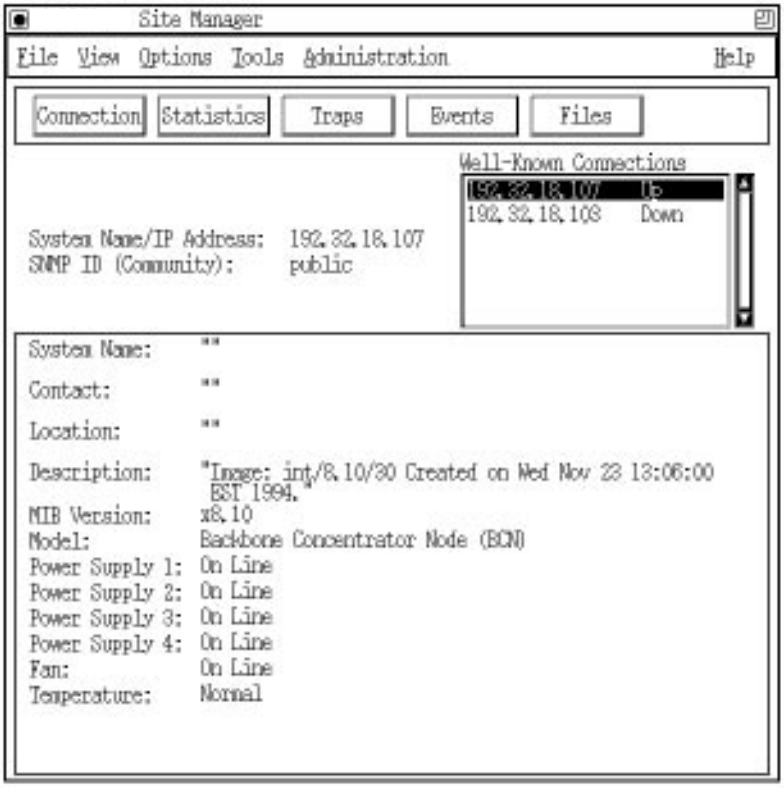

Figure 4-2. Site Manager Window

3. **Depending on whether you want to load the image onto more than one router, do the following:**

   a. **If you want to load the image onto only one router, refer to the next section.**

   b. **If you want to load the image onto more than one router, repeat Steps 1 and 2 for each router.**

4. **Select Options→Multiple Router Setup. The Multiple Router Connection window appears (Figure 4-3).**

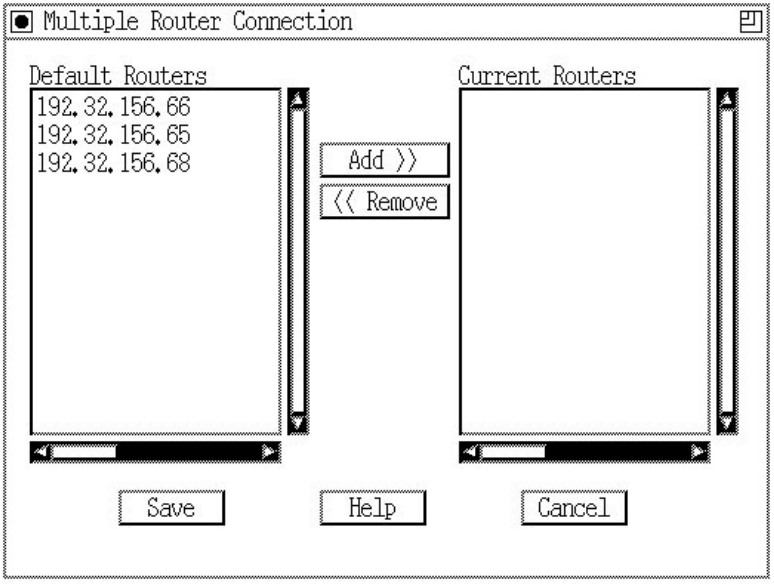

Figure 4-3. Multiple Router Connection Window

The Default Routers window lists the routers to which you are currently connected. The Current Routers window lists the routers whose files you want to manage simultaneously.

5. **In the Default Routers list, select each router to which you want to transfer the same image at the same time. Then click on Add. The selected routers appear in the Current Routers list (Figure 4-4).**

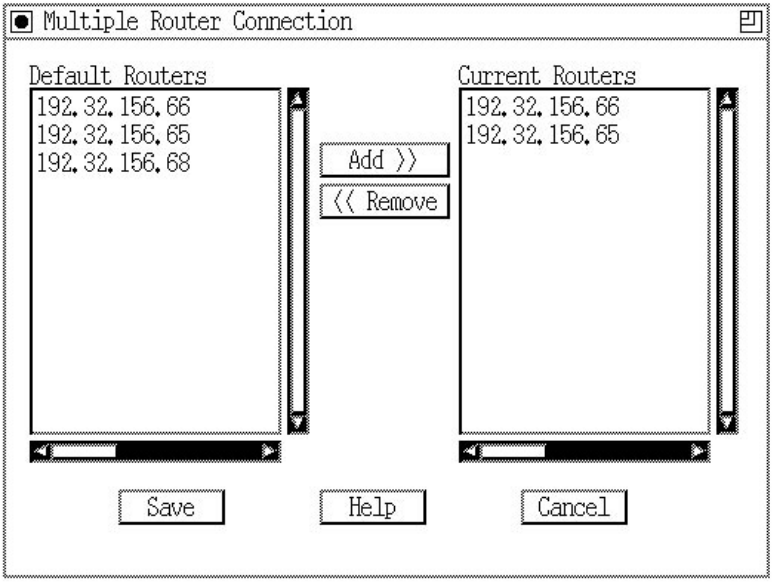

Figure 4-4. Adding Routers to the Current Routers List

If you inadvertently add a router to the Current Routers list, you can remove it from that list. To do so, select the router (in the Current Routers list) and click on Remove.

6. **Click on Save.**

Loading a Modified Image onto the Router's File System

Use the Router Files Manager tool to load an image onto the router's file system. To access this tool, select Tools→Router Files Manager in the Site Manager window.

The Router Files Manager window appears.

- If space is available, you should keep the old router software image on the router's file system until you succeed in booting the router using the new image. In this case, refer to the next section, "When Space Is Available."
- If space is not available, refer to "When Space Is Not Available."

When Space Is Available

If space is available on the router's file system, use the Router Files Manager to save the new image to the router's file system:

1. **In the Router Files Manager window, select the router volume where you want the image saved.**
2. **Select File→TFTP→Put File(s).**

   The TFTP Put File Selection window appears (Figure 4-5).

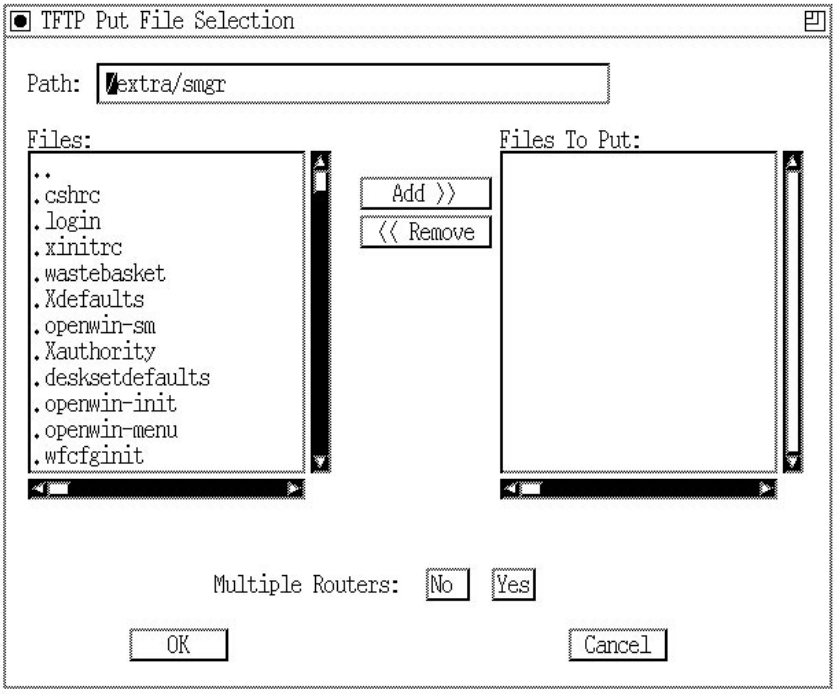

Figure 4-5. TFTP Put File Selection Window

3. **In the Path box, enter the pathname of the directory on the Site Manager workstation that contains the image.**

   The files in that directory appear in the Files window.

4. **In the Files window, click on the image filename; then click on Add. The selected file appears in the Files to Put window.**

   If you inadvertently add files that you do not want to transfer to the router, select those files in the Files to Put window. Then click on Remove.

5. **If you selected multiple routers (refer to "Connecting to a Bay Networks Router") and you want to transfer the image to all of the routers you selected, click on Yes in the Multiple Routers field.**

   If you selected only one router, or if you do not want to transfer the image to all of the routers you set up in the Multiple Router Connection window, click on No in the Multiple Routers field. In this case, if you previously set up multiple routers, the Router Files Manager transfers the image only to the router to which you are currently connected.

6. **Click on OK.**

   When the transfer (to each of the routers) is complete, the TFTP Put File Selection window closes and you return to the Router Files Manager window.

7. **Refer to the section "Booting the Router with a Modified Image."**

When Space Is Not Available

If space is not available on the router's file system, use the Router Files Manager to remove the old image from the router's file system before you save the new image there. The following sections provide information on how to remove the old image and save the new image.

Removing the Old Image from the Router

To remove the old router software image, proceed as follows:

1. **From the Router Files Manager window, select the router volume and filename of the old software image.**

2. **Select File→TFTP→Get File(s).**

   The TFTP Get Files window appears (Figure 4-6).

Figure 4-6. TFTP Get Files Window

3. **In the Destination Directory field, enter the directory on your Site Manager workstation where you want to store the old software image file.**
4. **Click on Yes to proceed.**

   The Router Files Manager transfers the image to the Site Manager workstation.

   If a file with the same name already exists in the destination directory on the Site Manager workstation, the file you are "getting" replaces it.
5. **Remove the copy of the old image still residing on the router's file system. To do so, select the file in the Router Files Manager window. Then select Commands→Delete.**

   A window prompts you to confirm your delete request.
6. **Click on Yes to delete the file.**

Note: *If the old router software image resided on a memory card in the router, select Commands→Compact after you remove the old image to reformat the memory card. Compacting typically takes several minutes.*

Saving the Modified Image to the Router

To save the modified image to the router,

1. **Follow the directions in "When Space Is Available."**
2. **Proceed to the section "Booting the Router with a Modified Image."**

Booting the Router with a Modified Image

1. **From the Site Manager window, select Administration→Boot Router.**

   The Boot Router window appears (Figure 4-7).

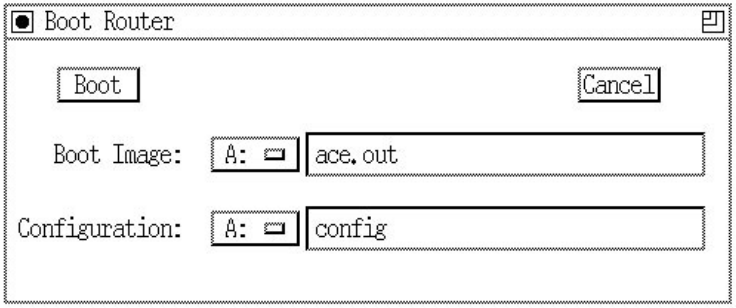

Figure 4-7. Boot Router Window

2. **Specify the correct router volume and type the name of the new router software image. Then specify the configuration file you want to boot from, and click on Boot.**

   A confirmation window appears (Figure 4-8).

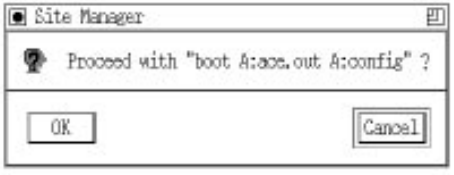

Figure 4-8. Boot Confirmation Window

3. **Click on OK.**
4. **Proceed to the next section to verify that the router booted successfully.**

Verifying that the Router Booted Successfully

You should verify that the router booted correctly with the modified software image. From the Site Manager window, select View→Refresh Display.

If Site Manager displays system information (such as the system name, contact, location, description, and MIB version), the router booted successfully.

If you did not remove the old router software image from the router's file system, use the directions provided in the section "When Space Is Not Available" to remove the image.

If Site Manager does not display system information in its main window, the router did not boot successfully. If possible, load the image back into the Image Builder and call your local Bay Networks Technical Response Center for further assistance.

If you can no longer access the router with Site Manager, refer to *Using Technician Interface Software* for instructions on using the **xmodem** command to access the router. Call your local Bay Networks Technical Response Center for further assistance.

Appendix A
Executable Files

This appendix provides a description of the executable files available from Bay Networks.

Table A-1. Executable File Descriptions

Executable Files	Descriptions
appn_cp.exe	APPN Control Point
appn_ls.exe	APPN Link Service
arp.exe	ARP Protocol
asn_mod.exe	ASN Link Module Driver
at.exe	AppleTalk Protocol
atm.exe	ATM Level 2
atm_dxi.exe	ATM DXI Protocol
atmalc.exe	ATM Link Module Line Driver
atmalcop.exe	Co-processor code for ATM Link Module
bgp.exe	BGP
chipcom.exe	Chipcom INs Module Driver
dcmp.exe	Decompression Code
debug.exe	Debug Protocol
dls.exe	DLSw Protocol
dmap.exe	Direct Memory Access Processor
drs.exe	DECnet IV Protocol
ds2180.exe	T1 Framer Driver
ds2181.exe	E1 Framer Driver
dsde2.exe	Dual Sync Dual Ethernet Link Module

(continued)

Table A-1. Executable File Descriptions *(continued)*

Executable Files	Descriptions
dst.exe	Dual Sync Token Ring Link Module
dtok.exe	Dual Token Ring Link Module
e1.exe	E1 Link Module
efddi.exe	Fibermux INs Module Driver
egp.exe	EGP Protocol
enet2.exe	Ethernet2 Link Module Driver
fddi.exe	FDDI Driver
fmpb.exe	FastMac Plus (Quad Token Ring)
fr.exe	Frame Relay Protocol
fsi.exe	FDDI Link Module
ftp.exe	FTP Protocol
hdlc.exe	SYNC Driver
hfsi.exe	HSSI Link Module
hilance.exe	Hilance Ethernet Interface Driver
hls_in.exe	Hughes INs Module Driver
hssi.exe	HSSI Driver
hwf.exe	Hardware Filters
igmp.exe	IGMP Multicast Protocol
ilacc.exe	ILACC Driver
ip.exe	Internet Protocol
ipx.exe	Internet Packet Exchange Protocol
isac.exe	ISAC Protocol
isdn.exe	ISDN Protocol
krnl_ace.exe	Advanced Communications Engine Kernel
krnl_an.exe	Access Node Kernel
krnl_asn.exe	Access Stack Node Kernel
krnl_bn.exe	Fast Routing Engine Kernel
krnl_in.exe	Integrated Node Kernel
lance.exe	LANCE Driver

(continued)

Table A-1. Executable File Descriptions *(continued)*

Executable Files	Descriptions
lapb.exe	LAPB Protocol
llc.exe	LLC Protocol
lm.exe	Line Manager Protocol
lnm.exe	LNM Protocol
mct1e1.exe	Multi-Channel T1E1 Link Module Driver
munich.exe	Munich Multi-Channel T1E1 Interface Driver
nbase.exe	APPN/SDLC Support Environment
nbip.exe	NetBIOS/IP Protocol
netboot.exe	NETBOOT Decompression
osi.exe	OSI Protocol
ospf.exe	OSPF Protocol
pcap.exe	Packet Capture
ping.exe	Ping Protocol
ppp.exe	Point-to-Point Protocol
qenet.exe	QUAD Ethernet Link Module
qsync.exe	QUAD Sync Link Module
quicsync.exe	Quick Sync Link Module Driver
rarp.exe	Reverse Address Resolution Protocol
sdlc.exe	SDLC Protocol
snmp.exe	SNMP Protocol
t1.exe	T1 Link Module
tcp.exe	Transmission Control Protocol
tftp.exe	TFTP Protocol
tms380.exe	Token Ring Driver
tn.exe	Telnet Protocol
tnc.exe	Telnet Client Protocol
vines.exe	VINES Protocol
vmeboot.exe	Upgrade Bootstrap for Flash System Controller
wan.exe	SMDS Protocol

(continued)

Table A-1. Executable File Descriptions *(continued)*

Executable Files	Descriptions
wcp.exe	Bay Networks Compression Protocol
x25.exe	X.25 Protocol
xns.exe	XNS Protocol

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